TRANSPORTATION

CONDITIONS AND TRENDS

BACKGROUND INFORMATION FOR THE TRANSPORTATION STRATEGY AND PROGRAMS REPORT. COMPILED BY THE SAN FRANCISCO DEPARTMENT OF CITY PLANNING·1976

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INTRODUCTION

Analysis of recent trends in transportation development is esstential to the evaluation of current transportation needs and the definition of a strategy to address those needs. Information contained in this report is meant to serve as background information for the various programs outlined in the Transportation Strategy and Programs Report (Department of City Planning, 1976).

Data have been gathered from a number of sources including local, regional, and state governmental agencies, public transit operators, and private enterprises involved in transportation.

Population and Employment - Recent Trends

San Francisco, the land area of which amounts to 0.6 percent of the nine-county Bay Area, in 1970 contained 15.4 percent of its population, and 25.5 percent of its jobs. It remains the principal city of the region with a 1970 population of 715,674. Demographic patterns reflect the changing nature of the population in San Francisco. Whereas population has decreased by approximately 8.5 percent over the last 15 years, the proportion of single and elderly persons has increased. Over the same time period, the total number of households has increased, but household size has decreased, pointing to the predominance of families with fewer children. Median family income has also decreased, particularly in proportion to the rest of the Bay Area. Median income for single persons has remained high.

Employment over the same 15-year period has increased by 12.4 percent. Approximately 501,500 persons were employed in San Francisco in 1973-175,000 in the Downtown area - of which 61 percent were San Francisco residents, 39 percent commuters from outside the City. There is evidence that an increasing percentage of new jobs downtown are going to non-residents. The number of blue collar jobs in San Francisco has decreased significantly within the last twenty years, with the largest declines occuring among craftsmen, foremen, and laborers. The number of out-commuters is substantial, with approximately 31,000-35,000 San Francisco residents working outside the City in 1970.

Total vehicle registration in San Francisco has declined slightly by .12 percent over the last two years. Automobile registration has decreased by 4.4 percent, whereas other vehicle registration increased by 14.8 percent. (Other vehicles are defined as commercial vehicles, motorcycles, and trailers.) San Francisco ranks fifth in percentage of total Bay Area vehicles registered, whereas it ranks third in population. Among the nine Bay Area counties, average car ownership per household is lowest in San Francisco at .78, compared to a Bay Area average of 1.31. The recent "energy crisis" has had a significant effect on auto usage. On a statewide basis, gas consumption decreased by 2.0 percent between 1974 and 1975.

These factors have resulted in a net increase as well as shifts in the nature of transportation demand. The higher proportion of low income and elderly persons among the population has increased the demand for public transit; whereas the growing number of single persons has resulted in a growing demand for all modes of transportation. Increased employment has meant a greater demand for transportation services and facilities to serve City residents and commuters in the peak periods, and significant out-commuting points to the need for increased regional transit facilities and coordination.

Reduced auto registration, combined with a low autos-per-household ratio, implies less traffic demands on the City's street system, a higher transit use for a variety of trips, and less demand on the City's parking facilities on the part of city residents. Greater auto registration in surrounding Bay Area counties, combined with increased commuting into San Francisco, implies increased traffic demands by non-residents. Increased commercial vehicle registration demonstrates additional demand for improved service vehicle accessibility.

I. CITYWIDE

Information on the citywide aspects of the City's transportation system is presented under the following headings: Municipal Transit; Transit Preferential Streets; Street Development; Maintenance; Citywide Parking; Recreational Travel; Special Needs; Transportation Information; Safety and Security; and Coordination.

MUNICIPAL TRANSIT

San Francisco Municipal Railway (Muni) total system patronage is estimated at 180 million passengers for fiscal year 74-75, up 5.2 percent over the previous fiscal year and up 6.7 percent over two years ago. Average daily ridership is estimated at 700,000 persons (approximately 500,000 revenue passengers, 200,000 transfers). Senior fares are estimated to comprise 2.7 percent of total patronage; student fares 18.5 percent. Trip patterns analyzed for base year 1970 reveal modal split for journey-to-work among San Francisco residents of 49.1% auto, 35.5% transit, 10.5% walk, 4.9% other means. With the Central Business District as a work-trip destination, 57.0% of San Franciscans use transit, 29.0% travel by auto, 12.0% walk, and 2.0% use other means.

Estimates of Muni patronage are made for accounting purposes only by the Public Utilities Commission (PUC) Accounting Office, and cannot be used to gain a full understanding of the operational problems of Muni. Counts on individual lines are taken only on a random basis.

Physical Upgrading

After decades of sparse capital improvement, Muni has recently embarked upon an extensive upgrading of its existing system. The overall program is not designed to increase the capacity of the system, except for the streetcar system, but rather to replace and renovate outmoded equipment and facilities.

The upgrading has been funded by a series of grants, all of which are administered by the Urban Mass Transportation Administration (UMTA), and the Metropolitan Transportation Commission (MTC). The four separate programs are the Transit Improvement Program (TIP), the Transit Equipment Program (TEP), the Systems Improvement Program (SIP), and the Power Improvement Program (PIP). The total costs of these programs is over $285 million. Overall, $212 million has been provided by the Federal government, $73 million from local funds.

The net effect of the total program is to improve Muni service in three areas: equipment development, operation, and maintenance. Under the first category, Muni will be upgrading its existing fleet with 100 new diesel buses, 100 new Light Rail Vehicles (streetcars), 343 new electric trolley buses, and 25 new "midi" buses.

Operational improvements include upgraded train control systems, new administration and personnel facilities, passenger handling improvements (fare collection systems), and rolling stock operational improvements. Maintenance programs include rerailing, repaving, and tunnel repair, improved electrical delivery systems, and new storage, stations, service, and administrative facilities. Also included are a number of innovative projects considered timely and necessary for improvement of the system. These are: new passenger waiting shelters, motor coach noise suppressors, a computerized scheduling program, and rehabilitation of the Forest Hill Station. A line-item list of each program is included in Appendix A.

Service Levels

The Muni system is comprised of 72 basic routes extended over 702 round-trip line-miles. Of the total fleet, 80 percent are available in the weekday morning peak period and 88 percent in the evening peak. Night and weekend service is less extensive. Approximately 20 percent of the fleet is available at 10 p.m., while only 13 routes operate on a 24-hour basis. Weekend service amounts to an average of 28 percent of the fleet available.

The Muni Planning, Operations and Marketing (POM) study, currently underway, is the first in-depth systemwide study ever conducted by the Muni. It includes an evaluation of existing Muni service; an on-board ridership survey; the development of short-range transit goals, objectives, and service plans, and the development of a short-range transit development program. The study also includes special studies of new track linkage

between the N-line and Balboa Park, and between the L and N-lines across the Sunset district; and the programmatic design and site selection for bus storage and service facilities. The POM study will be one of the most important data sources for the Muni Five-Year Plan.

The study is primarily focused on needed improvements to Muni's motor coach and trolley coach systems, and on determining their role in serving existing transit travel and potential new transit markets with the completion of the new Muni Metro (LRV) system and full operation of BART. To accomplish this, a major element of the overall study is directed toward surveying the existing Muni ridership to determine their travel patterns characteristics and service needs.

Included in the study design are Muni driver and citizen involvement to ascertain their respective views regarding needed imporvements to Muni service, and to elicit comments on goals and objectives. Functional concepts for needed transit priority treatments will also be formulated for selected high-priority streets.

Convenience Programs

The Muni Fastpass, a system by which patrons can purchase unlimited rides for $11/month ($2.50/month for seniors), initiated in August 1974, has proven a tremendous success with over 40,000 Fastpasses and over 5,000 senior passes now being sold each month. This amounts to about 20 percent of total patronage.

TRANSIT PREFERENTIAL STREETS

Certain streets within the City which serve heavily used transit lines are designated as Transit Preferential Streets in the Transportation Element of the City's Master Plan. On these streets, certain treatments are made by the Department of Public Works (DPW) to give transit vehicles priority over autos, where conflicts between autos and transit occur, and to decrease transit travel time. One hundred fifty miles of streets are so designated in the Master Plan.

The first phase report on the Transit Preferential Streets Program prepared jointly by the Department of Public Works, Municipal Railway, and City Planning, was adopted by the City Planning Commission on October 25, 1973, pursuant to Board of Supervisors Resolution 189-73. Three streets thus far have received Transit Preferential treatment (Polk Street, .38 miles; Post and Sutter Streets, 2.58 miles; total, 2.96 miles), although portions of seven streets were to be redesigned in the first phase of the Plan. Mission Street, between 11th and Beale Streets, and 4th Street, between Mission and Harrison, are currently scheduled to receive some form of Transit Preferential treatment.

As part of the Municipal Railway's Planning, Operations, and Marketing (POM) Study, an additional 25 miles of Transit Preferential streets are to be studied and implementation concepts recommended. The Five-Year Plan will also include a Transit Preferential Treatment element.

To maximize the benefit of the new Muni-Metro system, Muni, as part of its Transit Improvement Program, is in the process of rerailing its streetcar lines, some of which have not been replaced since 1918. Along with the rerailing, semi-exclusive transit rights-of-way, with passenger loading islands have been planned on some portions of these lines. Recently completed by the Department of Public Works is a raised right-of-way for the "N" line, on Judah Street between 9th and 19th Avenues. An interdepartmental staff committee (DPW, Muni, Planning) has been working for over a year with all interested citizen groups on design details for the remaining portion of Judah Street from 19th Avenue to La Playa, and for the first few blocks of Church Street.

The purpose of the Muni Metro improvements is to enhance passenger safety, reduce delay-causing conflicts between transit vehicles and autos, and allow the Muni-Metro cars from various lines to connect at Duboce Street, forming trains in the subway under Market Street.

STREET DEVELOPMENT

San Francisco's street development program, the development or upgrading of various City streets, has diminished in recent years due to changing transportation needs and other funding priorities. Street development includes the City Aid, Assessed Street Improvement Program - where the City and adjacent property owners share the cost of street construction to provide access to properties on undeveloped streets. One major recent street development project was the Geary Boulevard underpass at Masonic Avenue, which allows diversion of some traffic from parallel residential streets.

Also included in this program is improvement of Redevelopment Area streets, signing and striping of recreational streets, and various street and sidewalk adjustment projects. Increasingly, street projects have become limited to safety improvements and maintenance only.

MAINTENANCE

Muni

Muni has been experiencing significant vehicle breakdown problems with its GM diesel buses, all of which were purchased at the same time and most of which have now reached the same critical advanced mileage simultaneously. A substantial percentage of the diesel bus fleet is currently inoperative, resulting in a significant number of delayed, shortened, and missed runs.

In 1975, Muni instituted a preventive maintenance program, which currently consists of a 6,000 mile engine inspection and nightly pit inspections to determine brake and undercarriage condition. Vehicle manufacturers recommend 1,500 to 3,000 mile engine inspections.

With the arrival of new equipment, the Municipal Railway has begun to implement the practice of preventative maintenance. However, years of deferred maintenance have produced an immense backing of repair work which has to be done in order to keep the current fleets running; because maintenance forces must be assigned to do this deferred maintenance, the Railway is having a hard time getting the preventative maintenance program going. The City has not adequately funded the "out of house" re-building program that would free shopmen to do preventative maintenance work. Furthermore, the City's failure to fill a small number of clerks' positions, which are necessary to maintain vehicle records for the preventative maintenance program, results in a diversion of shop forces to this bookkeeping activity, further diluting the Railway's ability to "catch up." The result of this is to promote continuation of the present inefficient wasteful and very costly maintenance system. The present method also results in highly unreliable service; at present, the City is spending more and getting less.

Streets

San Francisco streets must accomodate transit, bicycle, and pedestrian use, as well as the automobile. There are currently 850 miles of city streets, 96 percent of which are maintained by the Department of Public Works. The California Department of Transportation (Caltrans) maintains 12.54 miles of surface roads within San Francisco, as well as 7.01 miles of state freeway and 14.13 miles of Interstate freeway.

Present resources such as streets, signals, signs, and other hardware must be maintained for efficiency and effectiveness. The need for repair on different segments of the street system vary according to the level of traffic travelling on it. DPW's ongoing Street Maintenance Program includes street reconstruction, street resurfacing, slope and embankment stabilization, bridge structural maintenance, and street tree maintenance.

Average street life is approximately 75 years before reconstruction is necessary, which means that every year the City should resurface approximately 34 miles of roadway and reconstruct 11 miles. San Francisco is not maintaining that average. In fact, for FY 75-76, no city funds were allocated for street reconstruction. (Some reconstruction work has been programmed with Federal (FAU) funds in 1976.)

Street Related Facilities

The tree planting and street landscaping program has been a significant ingredient in improving the livability of San Francisco. Past budget cuts severely impaired the maintenance portion of the program, despite the fact that the Urban Design element of the Master Plan points to the presence of trees as the single most important element in enhancing the livability, amenity, and the character of San Francisco residential streets.

The Urban Design Plan, also notes that differences between through, collector, and local streets can be made clearer by varying the brightness, spread, and color of street lighting and the height, spacing, and scale of street light fixtures. The ongoing street lighting program consists of installation of fixtures by the Department of Public Works, with maintenance conducted by the Public Utilities Commission (PUC). Bond issues approved by the voters in 1964 ($7 million) and 1972 ($6.05 million) now cover replacement of old or obsolete facilities; whereas street lighting in new underground districts is funded out of gas tax monies. Maintenance costs are appropriated annually by the PUC.

CITYWIDE PARKING

A recent inventory indicates that there are approximately 116,000 off-street, non residential parking spaces available throughout the City, including the downtown area, Fisherman's Wharf, and institutional facilities; 224,000 on-street spaces are available throughout the City.

Controls over the parking supply are contained in the City Charter and various municipal and administrative codes. In addition, a number of policies regarding parking are to be found in the City's Master Plan. City agencies having jurisdiction over the provision of parking include, among others, the Board of Supervisors, City Planning Commission, Parking Authority, Airport Commission, and the Recreation and Park Commission. There is no single entity responsible for the overall management of parking in San Francisco.

The Plan for Transportation noted the need for expansion of its own parking plan at such time as more information became available regarding parking supply and demand. That information has recently been generated under the study entitled Parking in San Francisco, a joint report by the Departments of City Planning and Public Works under contract to the Metropolitan Transportation Commission, presented to the City Planning Commission in December 1975.

The study has developed citywide parking policies in harmony with the Transit First policy, and air quality and energy conservation standards, to be proposed for consideration as amendments to the Master Plan. The study has also analyzed a series of strategies proposed to consolidate the management and control of parking on a citywide basis.

RECREATIONAL TRAVEL

Urban Parks

Three major recreational areas will be opened or improved within the next three to ten years: the Golden Gate National Recreation Area (GGNRA), a new Shoreline State Park in the South Bayshore area, and the Northern Waterfront area of San Francisco.

The current Golden Gate Recreational Travel Study (GGRTS), funded by the Metropolitan Transportation Commission, is intended to produce a plan for the solution of current and anticipated recreational travel demands within the GGNRA. Park plans and transportation access plans are expected to be coordinated within this year (1976).

Development of the new Shoreline State Park is an extensive project involving the total transformation of an industrial area and the provision of basic access to make its use possible. The provision of park access should be carefully coordinated with other transportation needs of the South Bayshore area to avoid duplication of effort and expense to produce one multi-purpose roadway with maximum public benefit and minimum disruption of the environments of the bay shoreline and of the residential neighborhood. MTC has included the provision of such a roadway in its Regional Transportation Plan. Similar in alignment to the existing Hunter's Point corridor route, the facility would be a surface parkway of limited capacity to serve the Hunter's Point Shipyard, waterfront recreational facilities, including Candlestick Park, and the commercial traffic generated by shipping facilities and related employment activities of southeastern San Francisco.

Development aspects of such a circumferential, multi-purpose roadway are currently under study by the Departments of City Planning and Public Works, Caltrans, Port Authority, Redevelopment Agency, and the State Department of Parks and Recreation.

The transportation needs of San Francisco's Northern Waterfront, extending from Aquatic Park to the Bay Bridge, are far more extensive than recreational use alone. Here, as in the South Bayshore area, well-designed transportation facilities should serve a multitude of needs. Access needs include the growing employment and residential center of the Northern Waterfront and waterfront recreation.

The Department of City Planning is currently undertaking a number of important tasks relative to planning for the Northern Waterfront. The six-year old Northern Waterfront Plan is being reviewed for necessary amendments to respond to various legal restrictions and to community response to the type and amount of recreational access required in conjunction with desired development. A Total Design Plan is required by the Bay Conservation and Development Commission for the shoreline area between

Piers 7 and 24, which area acts as an important transportation and recreation hub for the City. A Transportation System for the Embarcadero Area (Department of City Planning, 1974) proposed several street (sidewalk and bikeway) and transit improvements to serve the recreational transportation needs of this area. The GGRTS, mentioned previously in this section, will also recommend solutions to the recreational access requirements in this area.

Bicycle Facilities

The Transportation element of the City's Master Plan designates 68 miles of streets as bicycle routes, and another 42 miles as "streets to be improved as bicycle routes". Twenty-nine miles of streets currently have some kind of bicycle route marking.

Bicycle routes are developed by the Department of Public Works within three different classifications. A Class I bike route entails construction of a separate right-of-way, such as currently provided along the southern side of Sunset Boulevard. A similar exclusive bike lane will be constructed within this fiscal year along Brotherhood Way to connect Lake Merced to the Daly City BART station. A Class II bicycle route includes signing and striping of exclusive bike lanes; a Class III route includes only signing and/or stenciling. DPW has sought special funding for the construction of new separated bicycle lanes on Upper Market Street, which will be installed as that street is reconstructed. Improvements are needed for safety and convenience on several existing bike paths, and significant gaps in the bicycle path network should be closed during the next three to five years.' The bicycle program has been funded by gas taxes; in fiscal year 1975-76 no money has been allocated by the Mayor's Office for this purpose.

SPECIAL NEEDS

The Muni Railway with its great diversity of vehicle types - buses, trolleys, streetcars, subway - can meet many specialized needs, particularly those caused by topography and land use patterns. Muni also provides specialized services for certain classifications of persons with special needs and interests -- shuttles for Southern Pacific commuters, shopper shuttles downtown, special vehicle shuttles to Laguna Honda, and special service to Candlestick Park and the Opera House. Muni further recognizes the particular needs of special classifications of urban residents by providing discount fares for the elderly, the handicapped and school children, and by reserving the front seats in all transit vehicles for use by the elderly and handicapped.

The City of San Francisco with its additional transit services -- jitney, taxi, ferry, BART -- as well as the responsive use of its limited street space -- provides a good mixture of modes and service characteristics.

Other transit systems in the Bay Area provide additional specialized services and facilities. The handicapped discount fare is available on BART, AC Transit, Golden Gate Transit, Santa Clara County Transit and Santa Rosa Municipal Transit. AC Transit also provides special buses, routes and schedules for bicyclists.

Handicapped Facilities

Sparse data is currently available concerning the transportation needs of San Francisco's elderly and handicapped residents. By extrapolating national data, it may be possible to assume that two-thirds of San Francisco's elderly residents currently use public transit without difficulty. But the remaining one-third, matched by a like number of people under age 65, suffer from handicaps which cause difficulties in using public transit systems. The majority of these persons have mobility limitations short of using crutches, wheelchairs or walkers. Another fifteen percent suffer from visual impairment, and another four percent have acute conditions, such as broken legs. Only about three percent of the "transit dysfunctional handicapped" use a wheelchair, while about 2½ percent are deaf. There is a need to provide transportation access to life-support facilities for the City's elderly and handicapped citizens.

The issue of providing accessibility in all modes of transportation to the handicapped has become one of significant importance in recent years. Although many automobiles have been converted to use by the handicapped, only recently have demands arisen to provide access to public transportation systems as well as to the street and sidewalk network.

In San Francisco, BART provides handicapped access to its system by means of reserved elevators at each station activated independently by handicapped persons. Additional elevators serve those Muni Metro stations under Market Street which are not shared with BART. Muni, in cooperation with the Department of Public Works and representatives of the handicapped community are also investigating further adaptability of its surface Muni Metro system to accomodate the handicapped.

The Department of Public Works is currently in the second year of a five year program to construct sidewalk ramps at intersections and other areas of major pedestrian flow in the downtown area, on neighborhood shopping district streets, and areas of major employment outside the downtown. Additionally, state law requires that any curb construction or rebuilding project must include ramps for the handicapped.

Jitney Service

Jitney para transit* service in San Francisco is available on two shuttle routes: along Mission Street from the Ferry Building to Daly City, and between the Southern Pacific Railroad depot at Fourth and

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* Para transit refers to all non-conventional transit, i.e. that which does not consist of buses and rail cars on fixed routes and set schedules. Para transit includes car and van pools, rental cars, bus service on a subscription basis, taxi cab and related service like dial-a-ride, jitney and limousine.

Townsend and downtown. Jitneys are 12 passenger vans running on flexible schedules, stopping for passengers at any point along the route. There are currently 30-40 jitneys operated independently in San Francisco. Along Mission Street jitneys parallel the route of a number of Muni lines; the fare is 30 cents (compared to 25 cents on the Muni), but the van will stop where the bus might not. Jitneys operating the SP/downtown shuttle provide a convenient alternative to commuters not wishing to take a Muni bus or walk a long 8 blocks to downtown. Data show jitneys currently operating at 30 percent of daily capacity. Subsequently, jitney service is somewhat random and at the whim of the individual operator.

Taxi Service

There are currently 849 taxis licensed to operate in San Francisco, distributed over eight companies. Rates are set by the San Francisco Board of Supervisors and current regulations restrict types of service to a strict one party-mileage fare basis.

TRANSPORTATION INFORMATION

Muni's current effort to improve on-street transit information includes bus shelters with maps and route information and plans for transit stop signing with route information. Muni has recently expanded its telephone information system, and all vehicles will soon bear the Muni information telephone number displayed prominently. Muni route maps are available at a number of locations throughout the City.

SAFETY AND SECURITY

Traffic Signals and Channelization

The Department of Public Works currently keeps traffic count data for all major streets and data on all reported accidents involving vehicles and pedestrians. DPW then uses this data, plus requests from citizens or other city departments, to identify problem areas and to design solutions. DPW's ongoing Traffic Signal Operation and Channelization Program is an operational program designed to respond to those needs, and to adjust traffic flow requirements due to other actions, such as new roadway construction, changes in traffic patterns due to protection of residential areas, new building development, and the need for increased safety (such as at school crossings). Elements of the program include phasing and location of traffic signals and realignment/restriping of of streets. For FY 1975-76, no city monies were allocated to this program.

Transit Security

According to preliminary findings of Muni's POM surveys, security for transit riders is considered to be a very important and immediately pressing problem. Recent attacks by teenage gangs on Muni buses illustrate the severity of the problem. Needs include security patrols on vehicles and at curb stops and closer police surveillance.

COORDINATION

Regional

San Francisco serves as a major transit transfer location as well as a terminal for work and other trips involving intra-regional transfers. Fare and transfer agreements have been concluded between BART and Muni (and between BART and AC Transit), although these arrangements do not exist among other Bay Area transit operators.

MTC and the major transit operators in the area have for the past two years attempted development of an Association of Bay Area Public Transit Operators, as a forum for studying and implementing coordination activities, although results have been very disappointing so far. These could include a common information source, better dovetailing of routes and schedules, publication of all-encompassing route and schedule information, and common standards for a variety of items (handicapped definitions, street signing, etc.).

Citywide

The budgetary process now used by the City does not provide a clear picture to anyone -- whether government official or taxpayer -- of where monies are going, what objectives proposed projects will achieve or what choices are possible. In an effort to improve the process, the past two years have seen increasing cooperation and coordination on fiscal, as well as policy, matters among the City departments involved with transportation. The Transportation Policy Group, consisting of the Directors of the Department of City Planning and the Department of Public Works and the General Manager of the Public Utilities Commission, has adopted a set of policy criteria for evaluating each proposed project in the capital budget and the FAU (Federal highway trust funds available to urban areas) program and a format for presenting these criteria in the budget. Dwindling City and State funds for highway-oriented transportation, combined with near total diversion of former transportation capital improvements monies (gas tax) to other purposes have compounded the transportation financing problem and made more significant the necessity of a clear picture of City expenditures for transportation.

II. NEIGHBORHOODS

Significant neighborhood transportation subject areas include: Protected Residential Areas; Truck routes; Residential Parking; Neighborhood Commercial Parking; Environmental pollution and other problems.

PROTECTED RESIDENTIAL AREAS (PRA)

Based in part upon findings of the Street Livability Study (San Francisco Department of City Planning, 1970, a part of the Urban Design Plan), the PRA program seeks to divert through traffic from residential streets and onto non-residential major thoroughfares wherever possible. General methods available for achieving this objective include:

1) Necking at intersections and street landscaping to reduce the "through appearance" of streets;

2) Sidewalk extensions or widenings on local streets to reduce effective roadway dimension;

3) Placing of diverters at intersections to limit the flow of traffic;

4) Increasing stop signs on local streets where timed signal streets exist nearby.

The Departments of City Planning and Public Works are working together to implement this program; one area has been completed in the Inner Mission.

TRUCK TRAFFIC

Various areas of the City suffer from excessive truck traffic, which can have a deleterious effect on business districts as well as adjacent residential streets.

Areas of the City particularly affected by heavy truck traffic include the Bayview-Hunter's Point and Mission Districts. The South Bayshore Plan element of the Comprehensive Plan, developed closely with neighborhood residents, relied heavily on the construction of a circumferential Hunters Point roadway to provide relief from traffic problems. The Mission Plan, developed with the community and recently adopted by the City Planning Commission, includes recommendations as to the separation of truck traffic from residential and neighborhood commercial streets.

RESIDENTIAL PARKING

Many, particularly more dense, older neighborhoods of the City have inadequate off-street parking. The City Planning Code currently provides for the creation of "community garages" in residential areas for neighborhood residential parking. A recommendation of the Department of City Planning's Residential Zoning Study is a concept to allow conversion of Nonconforming Uses in residential areas to community parking garages, where appropriate.

The congestion in residential neighborhoods caused by non-resident parking has been documented in a number of studies by both public and private agencies within the City. Areas of the City particularly impacted by commuter-parked automobiles include the Richmond District, Telegraph Hill, and areas surrounding the Glen Park and Balboa Park BART stations. Areas impacted by institution-attracted parkers include the areas surrounding the University of California Medical Center, St. Mary's Hospital, and Ralph K. Davies Medical Center.

NEIGHBORHOOD COMMERCIAL PARKING

The San Francisco Parking Authority currently operates 21 neighborhood parking lots comprising 824 spaces and two garages with 1,013 spaces located in various shopping districts. The lots are metered and self-park, with no monthly parking, and are financed by the City's Off-Street Parking Fund.

In late 1975 the Department of Public Works, in conjunction with the Parking Authority, surveyed relative parking demand within the various neighborhood shopping districts. This information should be helpful in establishing priorities for future expenditures for new parking in areas of high demand. The Parking in San Francisco joint report proposes new criteria for the location of individual facilities.

POLLUTION AND NOISE IN NEIGHBORHOODS

San Francisco has retained a large fleet of quiet, non-polluting vehicles for which the primary source of energy is provided by the City-owned Hetch Hetchy hydroelectric system. These vehicles are appropriate for routes within residential areas, particularly in dense and hilly neighborhoods.

The preventive maintenance program which has now begun at Muni will help to reduce noise insofar as equipment in good working order runs more quietly. New equipment for Muni will be quieter as all such equipment has been ordered with specifications designed to reduce noise levels.

SPECIAL VEHICLES

San Francisco has special problems with its topography and density that require special transit vehicles. The City's topography brought about the invention of the cable car in 1873 in order to provide a braking system that could allow transit use on some of the steepest grades, such as Fillmore and Clay Streets. The City maintained its large electric trolley bus fleet for so long to traverse hills which diesel buses could not negotiate until recently. Trolley coaches continue to have a performance edge over diesel buses on most hills. They are also less expensive overall for lines with certain operating requirements and characteristics.

San Francisco shares some problems with other urban areas. Both the Federal Government and U.S. industry have been very slow to respond to the needs of urban areas. For instance, total bus production in the United States is less than one-eighth that of Japan. San Francisco and other cities have had to initiate development of new transit vehicles.

To obtain the subway-surface rail car it wanted, Muni worked with the City of Boston, which was also looking for new equipment. With their joint order, San Francisco and Boston were able to offer a large market to make it profitable for a manufacturer to build a vehicle to the cities' specifications, rather than vice-versa. Even then the two cities could not find a satisfactory product from among traditional vehicle manufacturers, and they contracted with the aerospace firm of Boeing-Vertol to manufacture the new vehicle. That vehicle subsequently became the standard light rail vehicle (LRV) for the U.S.

Similarly, San Francisco joined with three other U.S. cities to order new electric trolley buses, going to Canada to find a suitable manufacturer. The entire fleet of new electric trolleys is scheduled to be put into service during 1976.

San Francisco has also contracted with another aerospace firm, Lockheed, to study the possible application of the kinetic energy wheel for electric trolleys.

III. DOWNTOWN

Several major transportation problems converge and are amplified downtown. Transportation needs are correspondingly more complex and solutions more difficult. Subject areas examined here include: Personal Mobility and Environment; Regional Facilities; Commute Corridors; Parking, and Travel Adjustment and Reduction Considerations.

PERSONAL MOBILITY AND ENVIRONMENT

The scale, the density and the resulting pedestrian traffic in the downtown identify that area as one with unique pedestrian-related needs and opportunities. Heavy pedestrian traffic is generally concentrated in corridors approaching major transit stations and terminals, between office buildings within a complex or within the Financial District itself, and within the Union Square area commercial shopping district.

Over 20,000 people exit the Transbay Terminal each morning toward downtown destinations. Intersections immediately north of the terminal on Mission now experience pedestrian congestion in the peak commute hours. Another developing major pedestrian corridor is between the Ferry Building and downtown.

To facilitate pedestrian flow within the Golden Gateway complex, upper level pedestrian bridges spanning roadways have been incorporated into the development scheme. This separation of traffic and pedestrian modes was once considered the solution to increased pedestrian density, but while some advantages are apparent, the Urban Design Plan does not recommend continuance of this practice for the rest of downtown.

The concept of a pedestrian street has been introduced within the downtown shopping district. Maiden Lane has for many years been closed to auto traffic during shopping hours. Powell Street, between Market and Ellis Streets, is now closed to all traffic except cable cars and service vehicles. Other pedestrian streets in the greater downtown area include Fulton Street between Market and Hyde Streets and between Larkin and Polk Streets, Ecker Street between Market and Mission Streets, and Market Street between Steuart Street and The Embarcadero.

Market Street Reconstruction/Beautification

In June 1968 the voters of San Francisco approved a $31 million bond issue to implement the reconstruction and beautification of Market Street from the Ferry Building to the Central Freeway. Primarily geared toward the pedestrian, the project included extensive sidewalk, plaza, and landscaped areas. Street furniture such as benches, bus shelters, kiosks, lighting, and waste receptacles were designed uniformly to reinforce the pedestrian scale of the street. Other elements of the plan

included provision of parking bays for service vehicles and new traffic signals and signing.

Initial reconstruction of the street itself was paid for by the BART District; the extended station mezzanines and plazas at the Powell and Civic Center stations were funded by a $20 million grant from the U.S. Department of Transportation (UMTA); remaining reconstruction and beautification, now nearly complete from the Ferry Building to McCoppin Street, has been financed by the San Francisco bonds. Implementation of the plan is the responsibility of the Transit Task Force.

Still to be designed and reconstructed is the remaining portion of Market Street from McCoppin to Castro Streets.

Transit within Downtown

Recent data shows downtown retail merchants capturing 31.9 percent of the City's retail sales, and 9.5 percent of the retail sales volume in the region (excluding Santa Clara County). Muni currently operates two Shoppers Shuttle routes within downtown. With a reduced fare of 10 cents per trip, the shuttles operate off-peak only, from 9:30 a.m. to 3:30 p.m. These routes are currently very poorly used. The #84 shuttle currently carries on the average 290 persons per weekday, or 12 percent of capacity. In terms of efficiency, the #84 ranks 65th out of 72 routes.

REGIONAL FACILITIES

Regional Transit Systems

BART

BART (Bay Area Rapid Transit), serving San Francisco, Alameda, and Contra Costa Counties, consists of 34 stations over 4 fixed routes traveling on 71 miles of track. Three routes provide transbay service (only two are currently operating). San Francisco has 8 BART stations, 8.0 route miles. The southern terminus of BART is located immediately south of the San Francisco County line. Four San Francisco stations serve the downtown/civic center area along Market Street, two stations serve the Mission District and the remaining stations serve residential districts in the southern part of the City. BART's existing fleet is approximately 450 vehicles, although currently less than 50 percent of these are operational on any given day (primarily due to maintenance problems).

Current seated capacity on transbay and Daly City runs is estimated at 4,300 persons/hour one-direction, with six car trains running on six minute headways. Ultimate design capacity of the system allows for ten car trains operating on two minute headways, affording a one-direction seated capacity of 21,600 persons/hour.

AC Transit

AC Transit serves Alameda, Contra Costa, and San Francisco counties, operating 75 routes over 2,960 round-trip line miles. Twelve basic routes operate transbay; from these 12 as a base, 42 routes operate transbay in the peak commute periods. All transbay routes terminate in San Francisco at the Transbay Terminal.

AC maintains a fleet of 796 diesel buses. Daily transbay runs are 775 westbound, 753 eastbound. Twenty-four hour service is available on a limited number of lines. Seated capacity on transbay runs for the 3-hour morning peak is 6,100/hour; for the 2-hour evening peak, 8,200/hour.

Greyhound

Greyhound Bus Lines provides commuter service to sections of Contra Costa County from the Transbay Terminal and Peninsula service over 13 lines from the Greyhound Terminal at Market and Seventh Streets. Peak period capacity for both East Bay and Peninsula routes is estimated at 1,450 persons.

Golden Gate Transit

The Golden Gate Bridge, Highway, and Transportation District (GGBHTD) controls all modes of transportation between the North Bay Counties and San Francisco. In addition to operating the Golden Gate Bridge, GGBHTD also operates a bus and ferry transit system known as Golden Gate Transit (GGT).

Serving Marin, southern Sonoma, and San Francisco counties, GGT operates ten local Marin County routes, five of which travel to San Francisco in off-peak hours. Twenty-four routes, as an expansion of basic service, are available transbay in the peak commute periods.

The commute function is considered most significant to the Bridge District with 78 percent of the total fleet of 250 buses traveling transbay in the morning. Seated capacity in the 6:00-10:00 a.m. peak is 10,350 persons, or 2,588 persons per hour.

GGT also operates a ferry transit system. One 582-passenger ferry currently makes eleven round-trip runs daily between the Ferry Building in San Francisco and a terminal at the northern end of Sausalito in Marin County. Plans are to expand the ferry system by adding three new 636-passenger ferries, running between San Francisco, the Sausalito terminal, and the new Larkspur ferry terminal. (Privately operated ferries also operate between San Francisco and Tiburon, providing both commuter and recreational travel needs.)

Southern Pacific

Southern Pacific, primarily functioning as a freight-handling operation, also serves commuters from the Peninsula. SP currently offers two-way commute service, operating eleven trips southbound from its depot at 4th and Townsend Streets in the 4:00-6:00 p.m. peak period, yielding a seated capacity of roughly 6,500 persons per hour.

Airporter

In addition to the aforementioned Peninsula transit service, Airporter buses provide shuttle service between San Francisco International Airport and a downtown terminal, presently located at Taylor and O'Farrell Streets. Buses run to and from the airport every 15 minutes between 6:00 a.m. and 10:00 p.m., every 30 minutes between 10:00 p.m. and 12:00 a.m., and correspond to flight schedules between 12:00 a.m. and 6:00 a.m. Buses have a seated capacity of 45 passengers, for a one-way hourly capacity of 180.

Regional Terminals

There are currently four major transit terminals within the downtown area: the Transbay Terminal at First and Mission Streets serving AC Transit, Golden Gate Transit, Greyhound's Contra Costa bus service, and other national, regional and charter carriers; the Greyhound Bus terminal at 7th and Market Streets; the Airporter downtown terminal at Taylor and O'Farrell Streets, and the Southern Pacific (SP) depot at 4th and Townsend Streets.

The San Francisco Board of Supervisors has called for retention and development of the Transbay Terminal site for a regional transit terminal, and several studies have been completed and others are underway to accomplish that end. The San Francisco Bay Area Transportation Terminal Authority was established January 1, 1975, to develop such a terminal. One of the considerations of the development scheme is the accomodation of Greyhound long-haul service, Airporter Bus, and Southern Pacific Railroad, as well as Golden Gate Transit and San Mateo transit buses. Greyhound has expressed the need to vacate its present outmoded terminal; the current airlines terminal is due to be vacated in 1979; the future of SP's commute operations is currently under study (one consideration of that study is whether to extend any upgraded Peninsula rail transit service to the Transbay Terminal site).

Regional Highways

A number of State and Federal highways pass through San Francisco, while also serving as regional highway system connectors. All of these

roadways are maintained and/or improved by Caltrans. The regional highway program for 1976 consists of repaving surface roadways (U.S. 101 - Van Ness Avenue), safety device installation, and modification of directional signing. Also scheduled for construction in 1976 is an on-ramp onto I-280 from Fourth Street.

The Embarcadero Freeway

A series of Board of Supervisors resolutions since 1965 have called for the demolition of the Embarcadero Freeway. Resolution No. 828-73 adopted December 10, 1973, requested the Department of City Planning to undertake a short-term study of alternatives, a physical redesign and financial plan. The study, entitled A Transportation System for the Embarcadero Area (Department of City Planning, November 1974), resulted in recommendations for improvements in the area combined with demolition of the freeway. As noted in the study, "When the elevated Embarcadero Freeway was designed in 1953 it was to have been one segment of a multiple-freeway network in San Francisco. Not only was there to be a link to the Golden Gate Bridge, but there was also to be a Southern Crossing to Alameda and an additional -- third -- Peninsula Freeway to the east of the Bayshore Freeway. These facilities and the travel patterns they would have encouraged were rejected by San Francisco and later by the region, most recently in MTC's Regional Transportation Plan."

The Embarcadero Freeway was designed as a route through a then primarily industrial area, and the decisions and changes which would cause the Embarcadero area to change dramatically as the downtown core of San Francisco grew toward the Bay were not taken into account. Although the north of Market ramp system was later shifted somewhat to accommodate the Golden Gateway Redevelopment Area, the Embarcadero Freeway itself became a rather incongruous eastern boundary to the area, particularly in light of later private development and the Embarcadero Center.

The concept of a major public open space on the Embarcadero edge of the congested urban core became a reality when Justin Herman Plaza and Park was provided as part of the Embarcadero Center. But the use and value of the Plaza are impaired by the fact that it must stand in the shadow of the freeway; construction of the second phase, the park portion, on the blocks north of the Plaza has had to proceed, despite the fact that the elevated Clay and Washington Street freeway ramps run right through the middle of it.

Exclusive Lanes on Bridges and Freeways

The concept of reserving traffic lanes for exclusive use by buses initially appeared in the Transit Preferential Streets Program, discussed earlier in this report. The concept has now extended throughout the region

and has expanded to include car/vanpools. Currently, exclusive bus lanes exist at the Bay Bridge Toll Plaza; on I-280 southbound, between 6th Street off-ramp and U.S. Route 101, and on U.S. 101 northbound in Marin County from the Golden Gate Bridge to Greenbrae. These treatments also provide for carpools (3 or more per car) except in portions of Marin County. The Bay Bridge program has recently been expanded from commute hours to 12 hours of operation, from 6:00 a.m. to 6:00 p.m., and has expanded to two other bridges - the San Mateo-Hayward and Dumbarton Bridges. The GGBHTD has recently instituted a vanpool program on the Golden Gate Bridge, whereby registered vans (7 persons or more) may cross the bridge free during commute hours.

Multiple-Occupancy Vehicles

Carpools using the exclusive lanes at the three transbay bridges may cross toll-free. The California Department of Transportation, including District Four offices in San Francisco, currently operates a fleet of vans which are assigned to employees who agree to pick up and drop off fellow employees on their way to and from work. The UC Medical Center is planning to lease at least one 15-passenger van for operation in the Golden Gate corridor. The GGBHTD will shortly be offering Vans for lease to individual groups for this same purpose. Other such vanpools exist in the private sector.

COMMUTE CORRIDORS

East Bay Corridor

BART total system patronage as of May 1976 is estimated at 123,000 trips per day; Transbay runs account for 50,000 trips per day (40.7 percent of total system), with commute transbay trips estimated at 12,500 trips per peak period one-direction. (Commute trips account for 50.0 percent of all transbay trips.) Related to current capacity, load factors show transbay runs in the commute over current seated capacity.

AC Transit transbay patronage as of May 1976 is 25,400 for the two commute periods (12,700 one-direction); 33,000 persons are carried transbay daily (2-way). The commencement of BART's transbay operation in September 1974 has had significant effect on AC patronage. Between February 1974 and February 1975, AC transbay ridership decreased 28.5 percent, resulting in a reduction in runs of 13 percent. AC's East Bay patronage increased by 3.7 percent for the year, whereas overall system patronage declined by 6.0 percent.

Greyhound East Bay ridership for the morning peak period is estimated at 1,000 persons.

On the San Francisco-Oakland Bay Bridge average daily traffic as of May 1976 is estimated at 181,000 vehicles (2-way). In the morning peak period, 22,500 vehicles (not including buses) travel across the bridge on an average weekday in the westbound direction. Two thousand two hundred of these vehicles are carpools (3 or more persons per vehicle). Assuming a vehicle occupancy rate of 1.4 persons per vehicle (Toll Bridge Authority estimates), 28,420 persons currently enter San Francisco by auto, in addition to another 7,480 persons in carpools, for a total of 35,900 persons.

Estimated Trips to San Francisco
from East Bay Corridor
Average Weekday, 1976

Purpose	Auto	%	Transit	%	Total
Work Person Trips (morning peak)	35,900	57.8	26,200	42.2	62,100
Non-Work Person Trips	54,600	75.9	17,300	24.1	71,900
Total Person Trips (24 hour)	90,500	67.5	43,500	32.5	134,000

Peninsula Corridor

Access to San Francisco from the Peninsula (San Mateo and Santa Clara County) via transit is available now on three transit systems, Southern Pacific Railroad, BART, and Greyhound Bus Lines. The San Mateo County Transit District, recently established by the voters of San Mateo County, may replace or supplement the other transit systems in providing some manner of commute service to San Francisco. Southern Pacific, with passenger service only in the commute periods, carries approximately 8,100 persons in one direction. Greyhound, operating on a similar basis, carries about 1,825 persons in the two hour afternoon peak. BART, operating all day, offers access to Peninsula residents at the Daly City BART station. Currently, this station accounts for 14,900 trips/day, with 3,900 trips occuring in the morning commute period. (52.1 percent of daily trips are in the two peak commute periods).

Approximately 59,000 persons commute to the City from the Peninsula by automobile. The number of non-work trips by car is difficult to gauge, due to the large number of freeways and major thoroughfares which cross the southern boundary of the City. An estimate is that 240,000 auto-person trips one-way are made daily from the Peninsula to San Francisco.

The San Francisco International Airport accounts for close to 10 percent of daily auto traffic from the Peninsula. Northbound auto-person trips from the Airport to the City equal roughly 23,270 trips

per day. Airporter, the only transit service available between San Francisco International Airport and the City, carries approximately 6,000 persons daily.

Estimated Trips to San Francisco
from Peninsula Corridor
Average Weekday, 1976*

Purpose	Auto	%	Transit (not including Airporter Bus)	%	Total
Work Person Trips (morning peak)	59,000	80.8	14,000	19.2	73,000
Non-Work Person Trips	181,000	93.1	13,400*	6.9	194,400
Total Person Trips (24 hour)	240,000	89.8	27,400	10.2	267,400
			Airporter Bus		
Airport Trips	23,270	88.6	3,000	11.4	26,270

An analysis of transit needs and alternatives, as developed in four previous studies, is contained in a Department of City Planning report entitled Peninsula Corridor Transit (September 1975). The MTC, in conjunction with a number of different agencies, is currently in the process of restudying the possible transit alternatives to serve the Peninsula corridor. Entitled the Peninsula Transit Alternatives (PENTAP) study, it is a review of the four transit access studies completed so far. These are the San Francisco Airport Access Project, the San Mateo County Transit Development Project Study, the Southern Pacific Upgrading Feasibility Study, and the San Mateo County Local Bus Transit Study. The PENTAP study is to recommend the most feasible transit system for the Corridor. Completion of the study is scheduled for late 1976.

Golden Gate Corridor

Golden Gate Transit bus patronage has been steadily increasing since the commencement of service in December 1971. Currently 8,900 persons are carried on an average weekday in the morning commute peak period, compared to 5,450 three years ago (an increase of 63.8 percent). Transbay average daily ridership is now at 21,300, an increase of 63.8 percent over three years ago.

Golden Gate Transit ferry patronage is less extensive. Although serving a commuter function, many more persons currently are carried in the off-peak hours for recreational or other purposes, than for the commute.

*Source: "Alternate Analysis and Patronage Update" - Transbay Terminal Study, Daniel, Mann, Johnson & Mendenhall, July 12, 1976.

Monthly ferry patronage during 1975 ranged from 60,000 during winter months to 160,000 in the summer. Average weekday counts ranged from 1600 to 4800 compared to average weekend-day counts ranging from 2,700 to 5,800. Of the 11 daily trips made, the ferry makes three trips from Sausalito in the 7:00 a.m.-10:30 a.m. peak period, for a total peak period capacity of 1,746. Current patronage counts show this segment of daily operation heavily under-utilized with an average of 250-350 persons carried for the three hour period. Total commute counts are estimated at 21 percent of average daily patronage. This proportion has remained relatively constant over the last three years, whereas overall ferry patronage has increased steadily at the average rate of about three percent per year.

Average Daily Traffic (ADT) on the Golden Gate Bridge is currently estimated at 91,800 vehicles (2-directions). In the morning peak period, on an average weekday, 19,700 vehicles, excluding buses, currently enter San Francisco. Assuming an average occupancy rate of 1.3 persons per vehicle, 25,600 person-trips are made by auto in the morning peak period.

ESTIMATED TRIPS TO SAN FRANCISCO
FROM NORTH BAY CORRIDOR
AVERAGE WEEKDAY, 1975 *

Purpose	Auto	%	Transit	%	Total
Work Person Trips 1975	25,600	73.5	9,220	26.5	34,820
Non-Work Person Trips	53,170	81.3	12,150	18.7	63,320
Total Person Trips	78,770	78.7	21,370	21.3	100,140

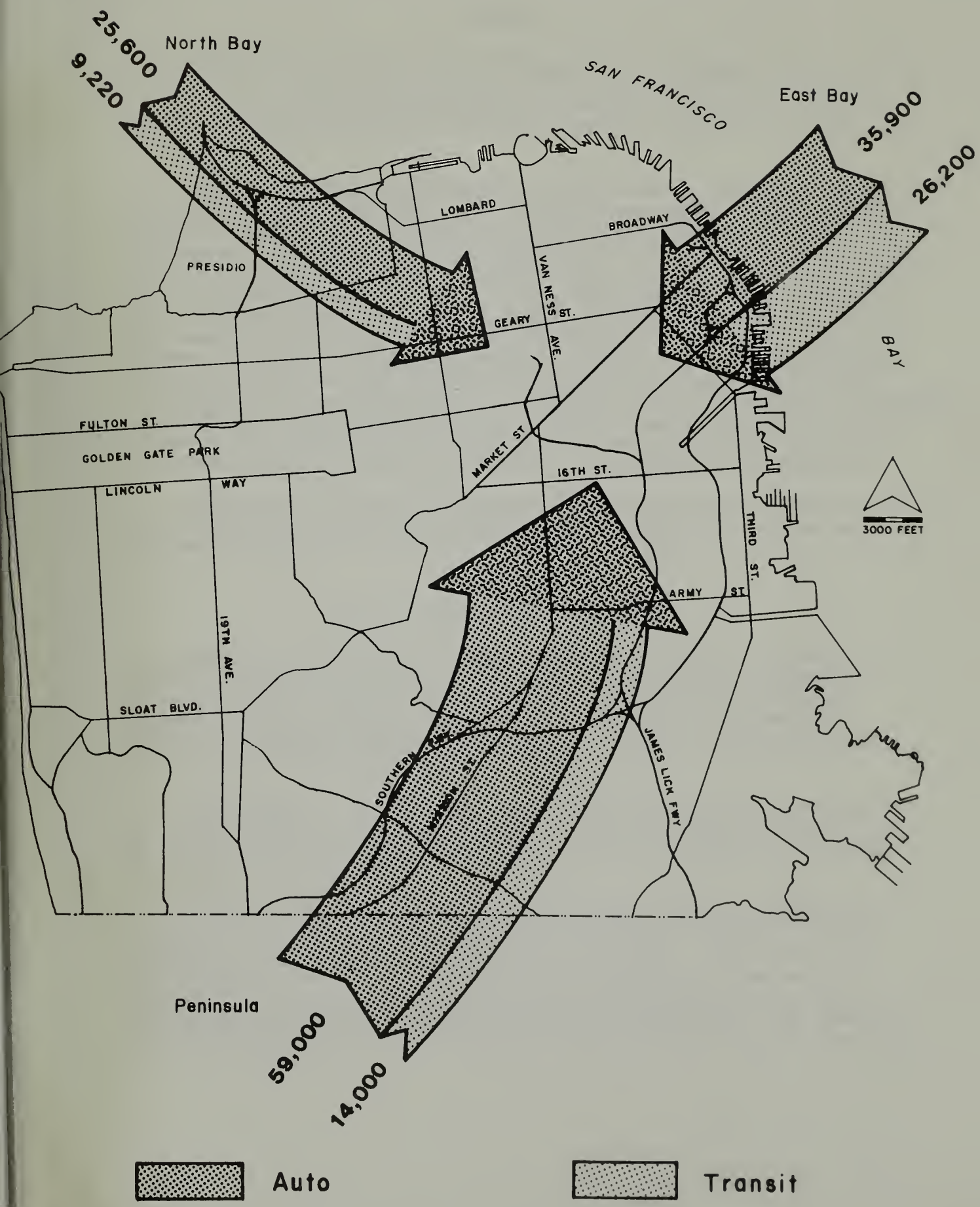
*Source: GGBHTD

According to the GGBHTD, 41 percent of autos crossing the bridge in the morning peak have destinations in the Financial District area, 12 percent in the Civic Center area, and 47% elsewhere. Thus, roughly 13,570 persons have destinations similar to those served by Golden Gate Transit, since GGT only serves the Financial District and Civic Center areas. Assuming that at least 9,000 persons riding the bus and ferry have destinations within these two areas, the modal split to areas served by GGT is 40% transit/60% auto.

The recently completed Golden Gate Corridor Study has developed and analyzed route alternatives to improve Golden Gate Transit service within San Francisco. The GGBHTD will develop a phased transportation plan partially based on this study. The objective of the GGBHTD is to develop a plan that offers the best opportunity for improving transit service with the least negative impact on local neighborhoods.

The existing bus system was used as the base to compare the alternative improvements. An increase in peak period patronage from 8,900 in 1975 to 11,700 in 1990 is forecasted for the existing bus system without route improvements in San Francisco. If there were no change in the existing system within San Francisco, travel time from the Golden Gate Bridge Toll Plaza to the Financial District is forecast to increase over 25 percent by 1990. Summaries of San Francisco's comments on the Golden Gate Corridor study are contained in a memorandum endorsed by the City Planning Commission on May 27, 1976.

PEAK PERIOD PERSON TRIPS INTO SAN FRANCISCO-1976



PARKING

The recently completed report Parking in San Francisco (December 1975) prepared jointly by the Departments of Public Works and City Planning as an input to MTC's Regional Transportation Plan, provides much useful data on parking conditions and trends in the City, especially for the downtown area.

There are currently approximately 8,097 on-street spaces, and 64,820 off-street parking spaces available in the downtown area. Compared with a total of 49,610 off-street spaces in 1965, this is an increase of 15,210 spaces over a 10 year period, an average growth rate of 1,520 spaces annually since 1965. The City's Parking Authority owns eleven parking garages and lots in the downtown area. These account for 8,398 spaces, 13 percent of all off-street spaces in this area, and 17 percent of all publicly available spaces. The largest growth in numbers of spaces occured in public garages, whereas the largest percentage of growth was in private garages- 218 percent over the 1965 level. The most recent data available shows 53 percent of all parkers parked for more than 4 hours (long-term). On-street parking meter revenue in the downtown area is currently placed in the Off-Street Parking Fund, currently to be used for construction of small (100-200 spaces) short term parking garages in scattered locations downtown.

Approximately 3,000 new off-street parking spaces will be added in the next five years if proposed projects previously approved or in the review process are built.

TRAVEL ADJUSTMENTS AND REDUCTIONS

Staggered Work Hours, an idea introduced recently, is a concept whereby the traditional 8:00 a.m. to 5:00 p.m. work pattern is altered to allow different arrival and departure times for workers. The primary purpose of such a program is to alleviate peak period crush demands on transit and street systems by redistributing the need for transportation services over a wider time frame.

A resolution was introduced before the San Francisco Board of Supervisors in the spring of 1975 endorsing this concept, and inviting private and other public employers to cooperate with City departments in helping to institute such a program.

The Greater San Francisco Chamber of Commerce has been involved for a number of years in working to implement staggered work hours and has collected a great deal of information on the subject. The Chamber has contacted City departments and major private employers to present the possibilities, and has conducted seminars explaining the concept with representatives of Caltrans and MTC serving as instructors. The sessions have been attended by over 185 different firms located within San Francisco.

The Golden Gate Bridge, Highway and Transportation District in that corridor and the San Francisco Public Utilities Commission within this city have also been developing and promoting staggered work hours.

Pricing Mechanisms

Pricing mechanisms can be used to reflect desired commutation policy, for example, charging travelers for the use of streets or roads in accordance with the marginal costs associated with the inconvenience each motorist creates for others. These prices might be administered in many ways:

- collecting tolls whenever a vehicle crosses into a congested zone (The Golden Gate Bridge District has discussed charging more for single passenger automobiles at peak periods.)
- imposing parking taxes or surcharge within congested zones (parking taxes could be used to discourage auto commuting without hurting retail uses by charging a higher percentage for long-term parking)
- using licenses which would be required for the legal operation of automobiles in selected zones
- lowering transit fares in an effort to influence road traffic conditions by drawing motorists to transit

Such congestion pricing is now being used in such economic activities as peak charges for telephone service, energy use, and airport landing fees.

Work/Live Downtown

Journey-to-work data for 1970 reveals that 12 percent of San Franciscans working within the San Francisco Central Business District walk to work. This phenomenon is in large part due to the proximity of the downtown to some of the more dense residential areas of the City and the recent addition of some residential units within new downtown office and/or commercial developments. Two of the most apparent and recent examples of this type of mixed-use development are the Golden Gateway complex and Fox Plaza.

Similar projects have been recently proposed; housing may be constructed in Yerba Buena Center, as part of the redevelopment of that area.

APPENDIX A

Muni Transportation Improvement Program
(TIP, PIP, TEP, SIP)

TRANSIT IMPROVEMENT PROGRAM

PROJECT ITEM	AMOUNT
Rerail Twin Peaks Tunnel	$ 1,588,000
Rerail N Line	4,591,000
Rerail L Line	2,790,000
Rerail J Line	1,260,000
Rerail K Line	997,000
Repave M Line	164,000
Rehabilitate Overhead Wire System	4,350,000
Forest Hill Station	12,000,000
Twin Peaks Tunnel Repairs	3,000,000
Rehabilitate Communications Control Center	300,000
New Rail Care Storage and Service Facility and K Line Terminal	16,000,000
Safety Train Control for Subway	3,500,000
Fare Collection & Passenger Guidance Equipment	4,641,000
New Shop Equipment	2,500,000
Radio Antenna in Subway and Tunnels	490,000
Vehicle Location Monitoring System, Communications and Surveillance Equipment	1,814,000
New Combined Central Shop and Replacement for Ocean Avenue Coach Yard	12,400,000
Conversion Potrero Coach Facilities	192,000
Replacement for Kirkland Motor Coach Yard	2,971,000
New Passenger Waiting Shelters	180,000
Construct New Cable Cars and Rebuild Existing Cars	497,000

PROJECT ITEM	AMOUNT
Extend Cable Car Line to Fisherman's Wharf	$ 1,900,000
Rerail Existing Cable Car Lines	1,996,000
Electric Strand Alarm System	73,000
Improve Cable Car Lighting & Braking System	91,000
Engineering & Inspection	8,094,000
Contingency	8,094,000
TOTAL GROSS PROJECT COST	$96,473,000

TRANSIT POWER IMPROVEMENT PROJECT

Project Item	Amount
Purchase and Install Rectifiers and Related Switchgear For:	
Sutter Substation	$ 759,000.00
Bryant and Downtown Substations	937,000.00
Outer Mission Substation	49,000.00
Substations "F" and "J"	1,625,000.00
Install Rectifiers and Related Switchgear from West Portal Substation at Richmond Substation	173,000.00
Real Estate Acquisition For:	
Sutter Substation	9,000.00
Substation "F"	115,000.00
Demolish Existing Buildings for Bryant Substation	6,000.00
Construct Buildings for:	
Sutter Substation	508,000.00
Bryant Substation	206,000.00
Furnish and Install Feeders for:	
Sutter Substation Area	5,751,000.00
Bryant and Downtown Substation Areas	5,294,000.00
Remainder of Area	6,656,000.00
Relocate and Reconstruct Trolley Coach Overhead Wiring-"Transit First" Program	215,000.00
Purchase and Install Subway Maintenance Telephone System	30,000.00
Purchase and Install Rectifiers and Related Switchgear for:	
Downtown and Laguna Honda Substations	1,282,000.00
Randolph, Taraval, Judah and West Portal Substations	1,683,000.00
Purchase and Install Gap Breakers at Four (4) Stations	238,000.00
Real Estate Acquisition for:	
Laguna Honda Substation	25,000.00
Randolph, Taraval and Judah Substations	123,000.00
Construct Buildings for:	
Laguna Honda Substations	301,000.00
Randolph, Taraval and Judah Substations	548,000.00

Project Item	Amount
Furnish and Install:	
Market Street Subway Feeders and Trolley Wire	4,033,000.00
Twin Peaks Tunnel Feeders	1,236,000.00
Trolley Wire in Twin Peaks Tunnel	1,190,000.00
Feeders for Surface Streetcar Lines	6,358,000.00
Sunset Tunnel Feeders and Trolley Wire	407,000.00
Purchase and Install Rectifiers and Related Switchgear for:	
Civic Center and Church Street Substations	1,630,000.00
Carl and San Jose Substations	1,017,000.00
Substations "E" and "N"	1,830,000.00
Purchase and Install Substation Supervisory Control System For:	
Market Street Subway and Twin Peaks Tunnel	185,000.00
Surface Streetcar Line	637,000.00
Sutter Substation Area	48,000.00
Bryant and Downtown Substation Areas	102,000.00
Remainder of Area	208,000.00
Real Estate Acquisition for:	
Carl Substation	3,000.00
Substation "N"	45,000.00
Engineering and Design for:	
Market Street Subway and Twin Peaks Tunnel	
Surface Streetcar Lines	
Sutter Substation Area	3,219,000.00
Bryant and Downtown Substation Areas	
Remainder of Area	
Construction Management and Inspection for:	
Market Street Subway and Twin Peaks Tunnel	
Surface Streetcar Lines	
Sutter Substation Area	2,105,000.00
Bryant and Downtown Substation Areas	
Remainder of Area	
Demolish Existing Building for San Jose Substation	6,000.00
Construct Substation Vaults for Civic Center and Church Street Substations	602,000.00
Construct Buildings for Carl and San Jose Substations	782,000.00

Project Item	Amount
Grantee's Staff and Force Account Work and Materials:	
Supporting Services, Project Administration, Etc.	921,000.00
Removal of Existing Overhead Feeder Cable	225,000.00
Contingencies for:	
Market Street Subway and Twin Peaks Tunnel Surface Streetcar Lines Sutter Substation Area Bryant and Downtown Substation Areas Remainder of Area	4,709,000.00
TOTAL GROSS PROJECT COST	$ 58,031,000.00
Less Sale of Copper and Obsolete Equipment	525,000.00
TOTAL NET PROJECT COST	$ 57,506,000.00

TRANSIT EQUIPMENT PROGRAM

Project Item	Amount
Purchase of 400 48 passenger radio-equipped transit buses	$ 15,698,524
Purchase of 80 articulated rail transit cars	28,000,000
Purchase of 20 small transit buses	1,000,000
Purchase of 11 used streetcars	44,000
Rehabilitation of 11 used streetcars	66,000
Purchase of 210 electric trolley coaches	16,634,976
Purchase of 242 radios for trolley coaches and small transit buses and installation of base stations	765,650
Purchase and installation of base radio station	33,268
Purchase of a used GM motor coach	31,622
Engineering - design & inspection	2,220,000
Contingency	2,170,000
TOTAL GROSS PROJECT COST	$ 66,664,040
Less: Proceed from sale of used equipment	-106,000
TOTAL NET PROJECT COST	$ 66,558,040

SYSTEM IMPROVEMENT PROGRAM

Project Item	Amount
Purchase of 20 additional subway-surface transit cars	$ 6,748,000
Purchase of 100 additional diesel transit buses	5,100,000
Purchase of 5 additional small transit buses	250,000
Purchase of 135 additional electric trolley coaches	11,337,509
Purchase of 252 radios for buses, trolley coaches and small buses and installation of base stations	825,087
Service vehicles for subway operation	480,000
Driver Training simulator	250,000
Motor coach noise suppressors	200,000
Computerized scheduling program (RUCUS)	500,000
Computerized operations and maintenance program (TIMS)	2,000,000
Office equipment and non-revenue vehicles	2,000,000
Municipal Railway facilities repair and rehabilitation project	2,000,000
Rerail M Line	2,196,000
Connect M Line to BARTD Balboa Park Station	1,536,000
Embarcadero Station Track Extension	10,000,000
Municipal Railway Headquarters Office Building	6,960,000
Surface Track Connection for J and N Lines	4,500,000
Engineering and Inspection	2,520,000
Contingencies	5,907,500
TOTAL PROJECT COST	$ 65,260,096

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